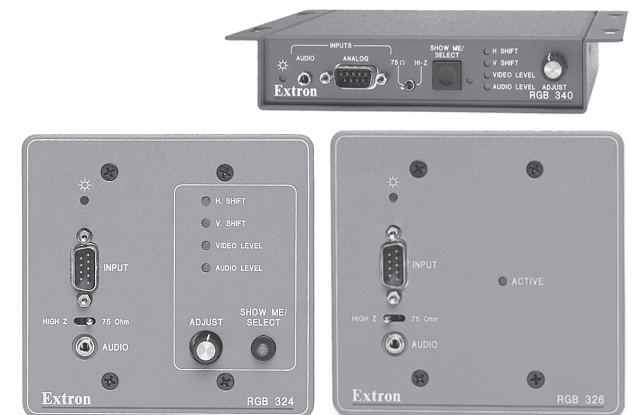


## User's Manual



## *RGB 324, RGB 326, RGB 340* Buffers for Use with the RGB 320 Switching Interface System



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# Precautions

## Safety Instructions • English



This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.



This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

### Caution

**Read Instructions** • Read and understand all safety and operating instructions before using the equipment.

**Retain Instructions** • The safety instructions should be kept for future reference.

**Follow Warnings** • Follow all warnings and instructions marked on the equipment or in the user information.

**Avoid Attachments** • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

## Consignes de Sécurité • Français



Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).



Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

### Attention

**Lire les instructions** • Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

**Conservé les instructions** • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

**Respecter les avertissements** • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

**Eviter les pièces de fixation** • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

## Sicherheitsanleitungen • Deutsch



Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.



Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

### Achtung

**Lesen der Anleitungen** • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits- und Bedienungsanleitungen genau durchlesen und verstehen.

**Aufbewahren der Anleitungen** • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

**Befolgen der Warnhinweise** • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

**Keine Zusatzgeräte** • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

## Instrucciones de seguridad • Español



Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.



Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

### Precaucion

**Leer las instrucciones** • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

**Conservar las instrucciones** • Conservar las instrucciones de seguridad para futura consulta.

**Obedecer las advertencias** • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

**Evitar el uso de accesorios** • No usar herramientas o accesorios que no sean específicamente recomendados por el fabricante, ya que podrían implicar riesgos.

### Warning

**Power sources** • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

**Power disconnection** • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

**Power cord protection** • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

**Servicing** • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

**Slots and openings** • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

**Lithium battery** • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

### Avertissement

**Alimentations** • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de le contourner ni de la désactiver.

**Déconnexion de l'alimentation** • Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

**Protection du cordon d'alimentation** • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

**Réparation-maintenance** • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à des opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

**Fentes et orifices** • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

**Lithium Batterie** • Il a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommande par le constructeur. Mettre au reut les batteries usagées conformément aux instructions du fabricant.

### Vorsicht

**Stromquellen** • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

**Stromunterbrechung** • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stromversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

**Schutz des Netzkabels** • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegestellt werden können.

**Wartung** • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

**Schlitze und Öffnungen** • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

**Litium-Batterie** • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

### Advertencia

**Alimentación eléctrica** • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearla ni eliminarla.

**Desconexión de alimentación eléctrica** • Para desconectar con seguridad la acometida de alimentación al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

**Protección del cables de alimentación** • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

**Reparaciones/mantenimiento** • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/ mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

**Ranuras y aberturas** • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

**Batería de litio** • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

# FCC Class A Notice

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Note: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance.

# Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of two years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:	Europe, Africa, and the Middle East:	Asia:
Extron Electronics 1230 South Lewis Street Anaheim, CA 92805, USA	Extron Electronics, Europe Beeldschermweg 6C 3821 AH Amersfoort The Netherlands	Extron Electronics, Asia 135 Joo Seng Road, #04-01 PM Industrial Bldg. Singapore 368363

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

*If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), or 65.383.4400 (Asia) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.*

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

# Table of Contents

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<b>Chapter 1 • Introduction</b>	1-1
<b>About the RGB 324, RGB 326, and RGB 340</b>	
<b>Interface Buffers</b>	1-2
<b>Features</b>	1-2
Additional RGB 324 and RGB 340 features	1-3
<b>Chapter 2 • Installation and Operation</b>	2-1
<b>Installation Overview</b>	2-2
<b>Installation and Operation Instructions</b>	2-2
Preparing the site, installing the wall box (RGB 324, RGB 326)	2-2
Mounting the RGB 340	2-4
Front and rear panel features	2-5
Front panel features and operation	2-5
Rear panel/circuit board features and jumpers	2-7
Opening the RGB 340 enclosure for jumper adjustment	2-9
Cabling	2-10
Input connections	2-10
Connecting shields	2-10
Connecting the buffer to the RGB 320 with installation cable	2-11
Preparing and terminating the cable	2-11
Pre-installation testing/troubleshooting	2-16
Mounting the buffer to the wall box (RGB 324, RGB 326)	2-17
Application diagram	2-18
<b>Appendix A • Specifications, Accessories, and Part Numbers</b>	A-1
<b>Specifications</b>	A-2
<b>Included Parts</b>	A-4
<b>Accessories</b>	A-4
<b>Cables</b>	A-4
<b>Appendix B • Dimensions and Template</b>	B-1
<b>Dimensions</b>	B-2
RGB 326 dimensions	B-2
RGB 324 dimensions	B-3
RGB 340 dimensions	B-4
RGB 324/RGB 326 wall box dimensions	B-5
<b>RGB 324/RGB 326 Cut-out Template</b>	B-6



# 1

## Chapter One

### Introduction

About the RGB 324, RGB 326, and RGB 340 Interface Buffers

Features

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## Introduction

### About the RGB 324, RGB 326, and RGB 340 Interface Buffers

The Extron RGB 324, RGB 326, and RGB 340 interface buffers distribute analog computer video and audio signals to the RGB 320 switching interface system. These buffers each offer a 300 MHz (-3dB) video bandwidth. They provide remote input connections to the RGB 320 interface for permanent installations in environments such as conference and training rooms or command and control centers.

Each buffer accepts one analog RGBHV, RGBS, RGsB, or RsGsBs computer-video input on a 9-pin D connector, and one unbalanced stereo audio input on a 2-channel stereo jack.

The RGB 324 and RGB 326 are available in grey, black, and white. The RGB 340 is available in grey only.

### Features

**Automatic setup with input signal detection** — When an input (buffer) is selected, the RGB 320 detects the computer type and scan rate, and loads the appropriate picture settings. Ten of the most popular computer scan rates and signal types are factory stored in the RGB 320's memory, so it is usually not necessary to make adjustments. If adjustments are required, the RGB 320 has fifteen additional memory blocks per input for storing user-defined picture control settings that are specific to the installation, so it is not necessary to make adjustments each time an input is selected.

**Furniture and wall mountability** — The RGB 324 and RGB 326 buffers have two-gang wallplates for installation on a wall or in furniture. The RGB 340 buffer is a shelf- or furniture-mounting version of the RGB 324 with mounting ears instead of a wallplate.

**Additional control methods** — The buffers can be controlled via the RGB 320 front panel buttons or through an RS-232 device using simple commands or Windows-based control software.

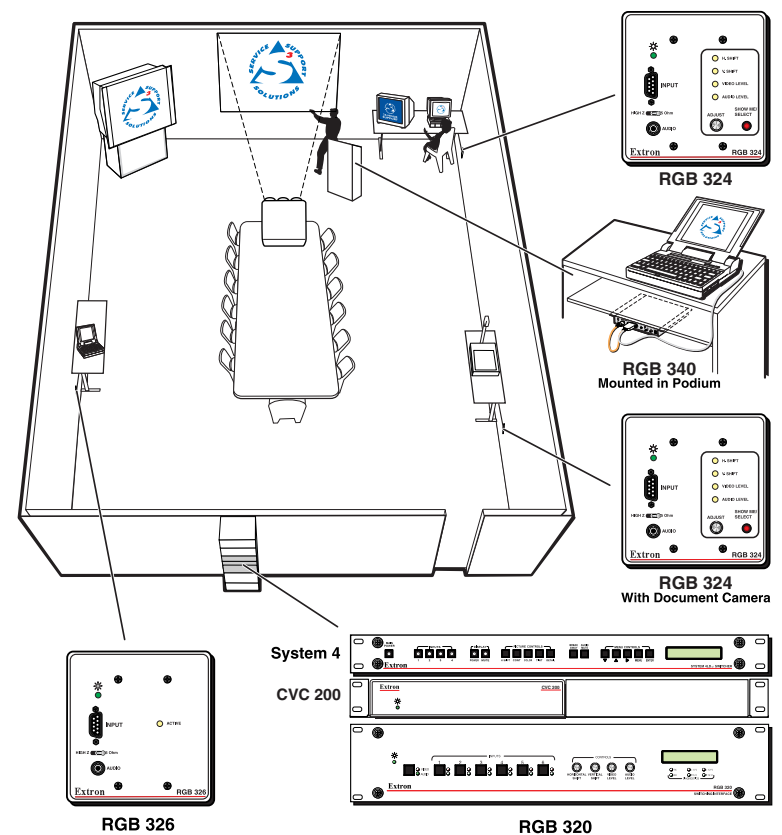
**Monitor termination** — Each buffer has a high impedance/75 ohm termination switch.

**Stereo audio** — Unbalanced stereo audio inputs can be output as balanced or unbalanced stereo audio.

### Additional RGB 324 and RGB 340 features

**“Show Me/Select” button** — Each RGB 324 and RGB 340 buffer has a “Show Me/select” button that allows a user to select that buffer as the source of the active input to the RGB 320.

**Centering and level controls** — Adjustments to horizontal and vertical centering and to video and audio levels for that input can be made directly from the RGB 324 and RGB 340 front panel control knobs. Adjustment settings for each buffer are stored in the RGB 320's memory.



**A typical installation of buffers with an RGB 320**



# Chapter Two

## **Installation and Operation**

Installation Overview

Installation and Operation Instructions

# Installation

## Installation and Operation Overview

To install and set up an RGB 324, RGB 326, or RGB 340 buffer, follow these steps:

- 1 Determine the installation location.
- 2 Prepare the site for installation. Use the template supplied in the appendix to mark the site, then cut out the wallboard or wood.
- 3 Set the jumpers. *The jumpers will be inaccessible after installation.*
- 4 Connect cables to the buffer for power and for audio and video output. *These cables will be inaccessible after installation.*
- 5 Set the front panel High Z/75 Ohm video termination toggle switch.
- 6 Temporarily connect input cables and apply power to the buffer, the RGB 320, and the input and output devices. See the “Pre-installation testing/troubleshooting” section in this manual.
- 7 Temporarily disconnect power. Remove cables as needed, and mount the buffer to the wall or furniture.
- 8 Reconnect cables and power, and adjust centering and levels as needed.

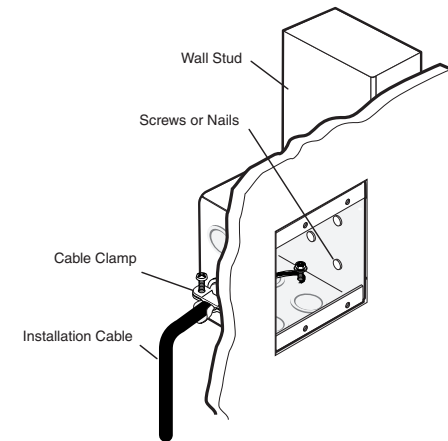
## Installation and Operation Instructions

### Preparing the site, installing the wall box (RGB 324, RGB 326)

When selecting an installation site, choose a location that will allow cable runs without interference, preferably next to a 2" x 4" wall stud or a structural element of the furniture. Allow enough depth for both the wall box and the cables. You may need to install the cables into the wall, furniture, or conduits before installing the buffer.

The RGB 324 and RGB 326 are typically installed in a 2-gang, 3.5-inch deep, metal wall box (provided by Extron). A different wall box, a plastic box, or no box at all can be used, as long as the installation conforms to electrical codes and to the interface's size requirements. Dimensional drawings and actual-size cut-out templates are provided in appendix B.

1. Cut out the center portion of the cut-out template, which is provided in appendix B.
2. Place the template (or the wall box) against the installation surface, and mark the guidelines for the opening on the wall or furniture.
3. Cut out the material from the marked area with a jigsaw or small hand saw.
4. Check the opening size by inserting the wall box (if used) or the interface (if no wall box is used) into the opening. The box and/or interface should fit easily into the opening. Enlarge or smooth the edges of the opening if needed.
5. Attach the wall box to the wall stud or furniture with nails or screws, leaving the front edge flush with the outer wall or furniture surface, as shown in the following illustration.



### Attaching the wall box to a wall stud

If attaching the wall box to wood, use four #8 or #10 screws or 10-penny nails. A minimum of 1/2 inch (1.3 cm) of screw threads must penetrate the wood.

If attaching the wall box to metal studs or furniture, use four #8 or #10 self-tapping sheet metal screws or machine bolts with matching nuts.

6. Feed cables through the wall box punch-out holes for connection to the buffer, and secure them with cable clamps to provide strain relief.
7. Exposed cable shields (braids or foil) are potential sources of short circuits. Trim back and/or insulate shields with heat shrink.

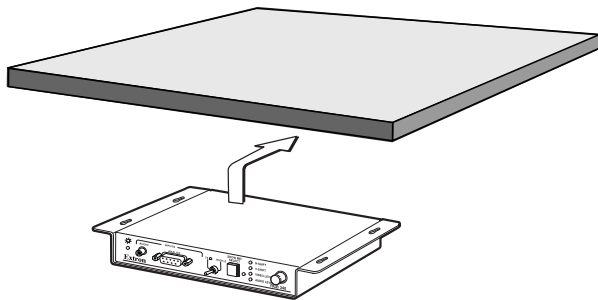


8. Set the rear panel peaking jumpers, and cable and test the buffer before fastening the buffer into the wall box. *The jumpers and cables will be inaccessible after installation.* See "Rear panel/circuit board features and jumpers" and "Cabling" in this chapter for details.

### Mounting the RGB 340

You may need to install the cables into the wall, furniture, or conduits before installing the buffer. A drawing showing dimensions is provided in appendix B.

1. Hold the buffer against the underside of the desk or other furniture. Mark the location of holes for screws on the furniture.
2. From the side of the furniture where the interface will be located, drill 1/4" (6.5 mm) deep, 3/32" (2.4 mm) diameter pilot holes in the furniture at the marked screw locations.
3. Insert and loosely fasten four wood screws into the pilot holes, leaving only 1/4" of the screw protruding.
4. Set the internal peaking jumpers and attach the cables to the rear panel. *The jumpers and cables will be inaccessible after installation.* See "Rear panel/circuit board features and jumpers" and "Cabling" in this chapter for details.
5. Align the screws with the slots in the buffer's mounting ears, and place the buffer against the surface (with the screws through the mounting ear slots).

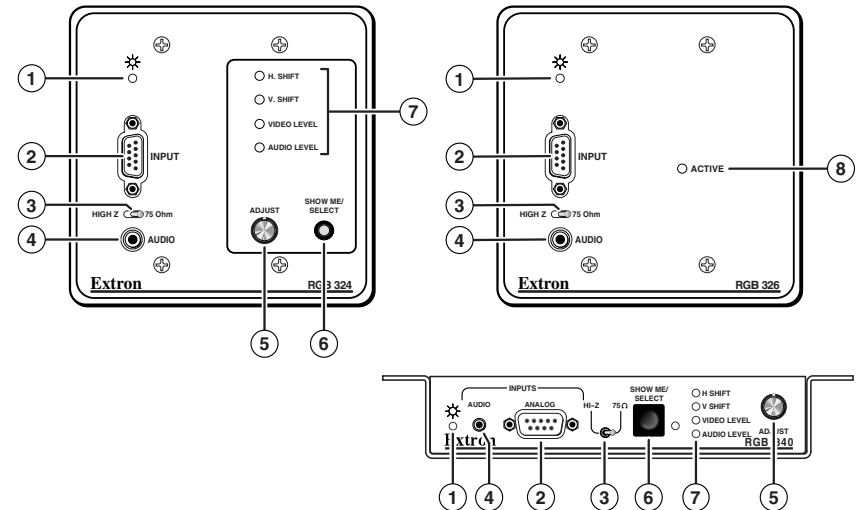


### Mounting the RGB 340

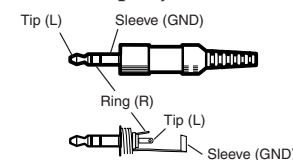
6. Slide the buffer slightly forward or backward, then tighten all four screws to fasten it into place.

## Front and rear panel features

### Front panel features and operation



- ① **Power LED** — The power LED:
  - Lights steadily to indicate that the buffer is receiving power.
  - Blinks when the RGB 320 is busy, indicating that the Show Me/select button must be pressed a second time to send the request to display that buffer's input (RGB 324/340).
- ② **Input 9-pin D male connector** — This port accepts analog RGBHV, RGBS, RGsB, and RsGsBs computer video signals via a monitor breakout cable (MBC) or laptop breakout cable (LBC).
- ③ **High Z/75 ohm switch** — Select the video termination impedance that provides the best picture.
  - Set this switch to High Z (high impedance) if a local monitor is connected, a laptop breakout cable is used, or if the picture is too dark (double-terminated).
  - Set this switch to 75 ohms if no local monitor is connected or if the picture is too bright or blooming (unterminated).
- ④ **Audio input jack** — This 3.5 mm female stereo jack is for left and right unbalanced stereo audio input. Wire the connector as shown at left.





- ⑤ **Adjust knob** (RGB 324, RGB 340) — Turning this knob adjusts the horizontal centering, vertical centering, video level, or audio level of the active buffer.

**NOTE** *After the RGB 320 switches inputs, wait for the projected picture and the horizontal and vertical scan rates on the RGB 320's LCD panel to stabilize before making adjustments. Adjustments made before the system stabilizes may not be stored in memory.*

To make adjustments, follow these steps:

1. While the buffer is active (the Show Me/Select button/LED is lit), press the Show Me/Select button. The H Shift LED lights to indicate that horizontal centering can now be adjusted.
2. Rotate the Adjust knob while viewing the displayed image to select the desired horizontal position of the picture.
3. Press the Show Me/Select button to activate the vertical centering adjustment. The V Shift LED lights.
4. Rotate the Adjust knob while viewing the displayed image to select the desired vertical position of the picture.
5. Press the Show Me/Select button to activate the video level adjustment. The Video Level LED lights.
6. Rotate the Adjust knob while viewing the displayed image to select the picture brightness.
7. Press the Show Me/Select button to activate the audio level adjustment. The Audio Level LED lights.
8. Rotate the Adjust knob while listening to the audio output to select the appropriate audio level.
9. Press the Show Me/Select button again or wait 7.5 seconds to exit the adjustment mode.

**NOTE** *When an adjustment reaches a minimum or maximum limit, the buffer's adjustment indicator (⑦) LED blinks.*

**NOTE** *The RGB 320's LCD display indicates the adjustments that are being made from the buffer.*

**NOTE** *The buffer has priority over the RGB 320 and the RS-232 control device in terms of making adjustments. Adjustments to a buffer's settings from the RGB 320 or the RS-232 control cannot take place while an adjustment is being made from the buffer itself.*

- ⑥ **Show Me/Select button** (RGB 324, RGB 340) — Press this button once to request the RGB 320 to send the signal from this

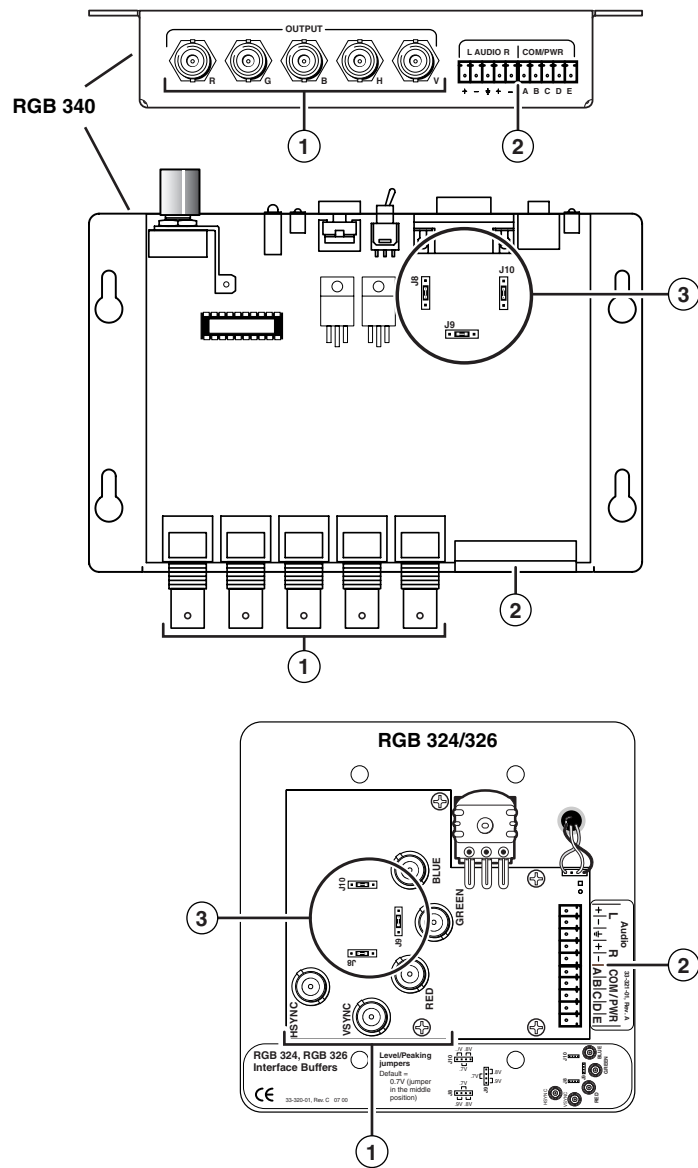
buffer to the display/projector. If the request is granted, the buffer's Show Me/Select button (RGB 324) or the LED next to the Show Me/Select button (RGB 340) lights. The LED corresponding to the input from this buffer will light on the RGB 320.

**NOTE** *If the RGB 320 is busy, the buffer's Power LED will blink, and the Show Me/Select button must be pressed again to send the request.*

Press the Show Me/Select button twice in succession to enter the adjustment mode. In adjustment mode you can make adjustments to centering and to audio and video levels by rotating the buffer's Adjust knob.

- ⑦ **Adjustment indicator LEDs – H Shift, V Shift, Video Level, Audio Level** (RGB 324, RGB 340) — Each of these LEDs lights when that adjustment is selected. See ⑤ above.
- ⑧ **Active LED** (RGB 326) — This LED lights to indicate that the buffer has been selected (via the RGB 320's front panel or an RS-232 control device), and it is providing the input to the display/projector.

Rear panel/circuit board features and jumpers



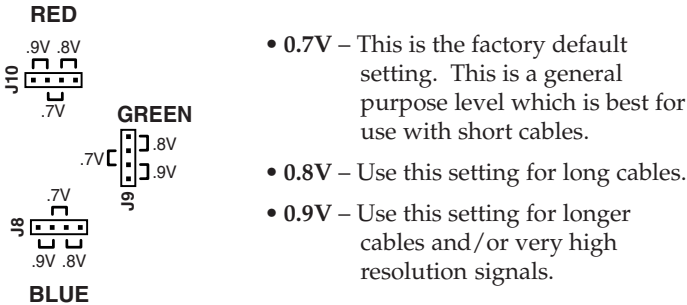
- ① **Video output BNC connectors** — Connect coaxial cables to these connectors for RGBHV, RGBS, RGsB, or RsGsBs analog video output. For composite sync (RGBS) signals, connect the sync cable to the BNC connector labeled V or VSYNC.

- ② **Audio output and communications/power connector** — Wire this 3.5 mm 10-pole captive screw connector as shown in “Connecting the buffer to the RGB 320 with installation cable” in this chapter (pages 2-11 to 2-14).

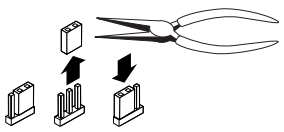
The left half of this connector is for audio output to the RGB 320. The right half of this connector serves as a port for power and buffer-RGB 320 communications.

- ③ **Level/peaking jumpers** — Changes to video peaking may be needed for high resolution signals or to compensate for signal loss from long cable runs. The buffers have separate jumpers for red, green, and blue video signals. See the diagram shown here or on the product label, and, for the RGB 340, also see “Opening the RGB 340 enclosure for jumper adjustment” below.

**WARNING** Changes to internal jumper settings must be performed by authorized service personnel only.



To configure the jumpers, use pliers to pull the jumper shunt off the pins, then place the jumper on the appropriate pins.

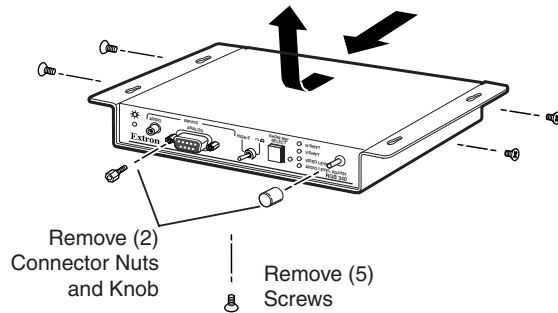


Opening the RGB 340 enclosure for jumper adjustment

The RGB 340's level/peaking jumpers are located on the circuit board inside its enclosure. To open the enclosure and adjust the jumpers, do the following and refer to the illustration on the next page:

1. Remove power from the RGB 340.
2. Remove the five screws that attach the upper part of the enclosure to the lower part.
3. Remove the two hex bolts that fasten the front panel to the 9-pin D analog video input connector.

4. Remove the Adjust knob. You may need a very small diameter Allen wrench to loosen the nut that holds it in place.
5. Slide the top part of the enclosure slightly forward, then upward to remove the cover. The circuit board remains in the bottom portion of the enclosure.



### Opening the RGB 340 enclosure

6. Set the level/peaking jumpers. See the jumper diagram on page 2-9.
7. Reverse steps 2 through 5 to replace the cover.

## Cabling

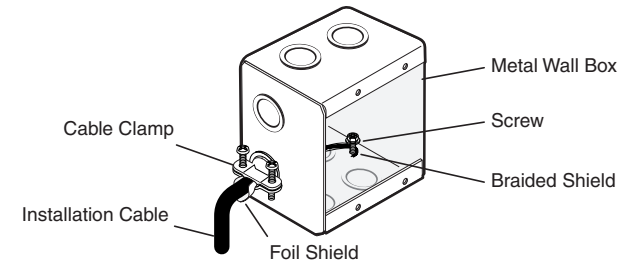
All the output, power, and control cables from the RGB 324, RGB 326, and RGB 340 buffers go directly to the RGB 320 switching interface. Refer to the *RGB 320 User's Manual* and see "Connecting the buffer to the RGB 320 with installation cable" in this chapter when making and connecting cables for the buffers. Run the cables through the wall/furniture and into the electrical box (if used) before attaching connectors.

### Input connections

Input connections and audio input connector wiring are discussed on page 2-5.

### Connecting shields

Multiconductor cables contain several braided and foil shields. At the buffer end of the cable, the **outer braided and foil shields** should be connected to the grounded metal wall box (or to a grounding wire if a metal wall box is not used). The wires that make up the braided shield can be unbraided, then twisted together to form a large, multi-strand wire that can be folded back under the wall box cable clamp or attached to the metal wall box with a screw. See the following illustration.



### WARNING

To prevent short circuits, the outer foil shield can be cut back to the point where the cable exits the cable clamp. Trim back or use heat shrink to insulate all shields (braided or foil) from the circuit board. If shields contact the circuit board, a short circuit may occur. Also, both the braided and foil shields should be connected to an equipment ground at the other end of the cable.

### Connecting the buffer to the RGB 320 with installation cable

The cabling examples on page 2-14 and 2-15 show a buffer wired for RGBHV video and balanced audio output using seventeen conductor plenum installation cable.

Extron recommends using Extron's seventeen conductor bulk plenum installation cable (part numbers 22-111-03, 22-111-04) or equivalent. Installation cable includes coaxial cables for video signals, shielded twisted pair wires for audio, and single conductors for power and communications signals.

### WARNING

Connect the cables between the buffer and the RGB 320 interface on a **one-to-one** basis. Cable conductor assignments **must be the same at both ends of the cable**, or damage may occur to circuits in the buffer and/or the RGB 320.

### WARNING

Remove power from both the buffer and the RGB 320 while cables are being attached.

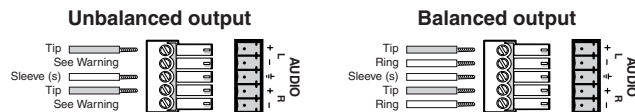
### Preparing and terminating the cable

Use the illustrations on pages 2-14 and 2-15 as wiring guides. They show connectors and conductor assignments for the buffers and the RGB 320.

1. Select and install a multiconductor cable, such as the Extron Plenum seventeen conductor installation cable, which contains appropriate conductors (at least 5 coaxial, 3 sets of shielded twisted pair, 3 single 20 AWG) for the video, power, control, and audio signals that this system will use.

## Installation and Operation, cont'd

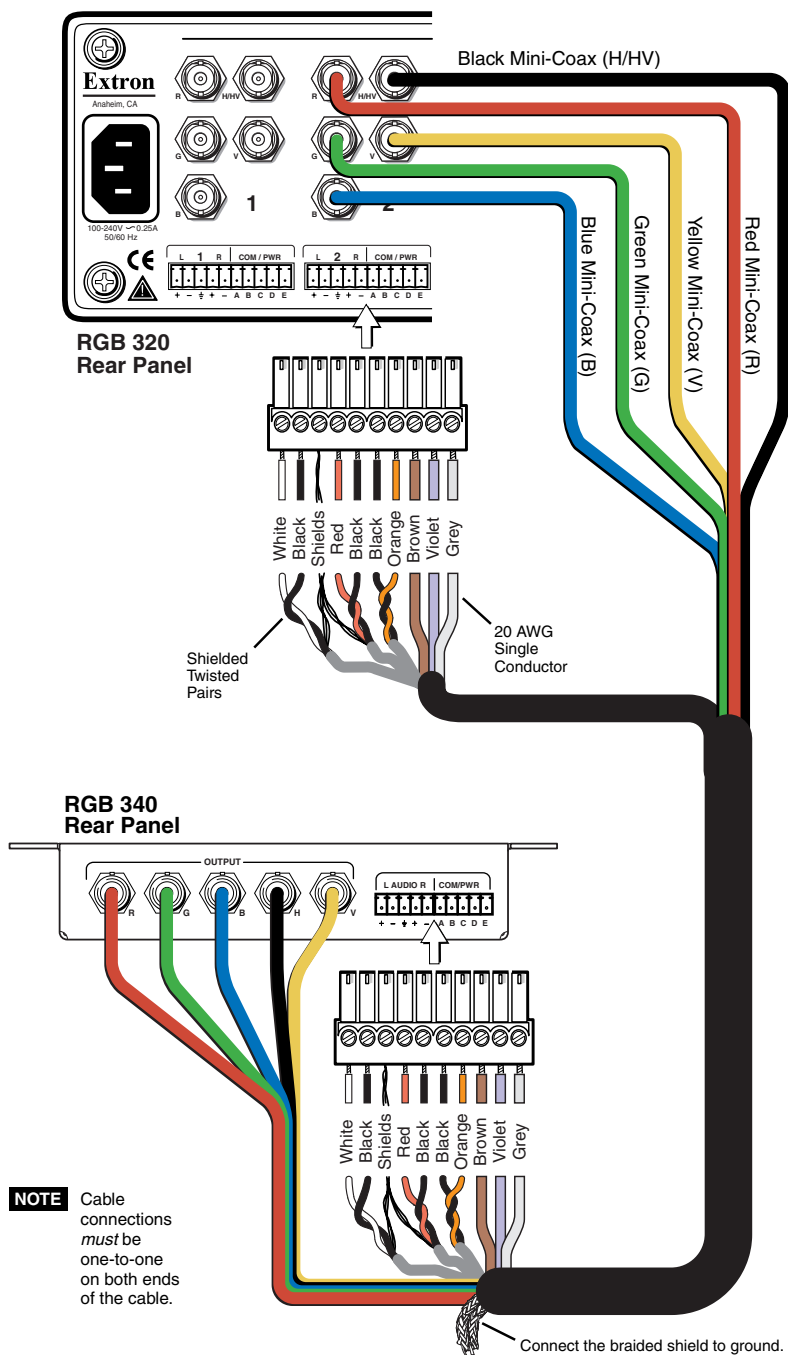
2. Determine what colors of each conductor type will be used for which signal, or use the examples provided in this manual.
3. Strip 7" to 8" (18 cm to 20 cm) of the outer jacket from the end of the cable.
4. Use a pointed tool to separate the braided wire shield surrounding the cable. Pull the ends of the braid away from the cable, twist the braid wires together, and clamp them to the electrical box (if used). See "Connecting shields", page 2-10.
5. Unroll and cut off the foil shield.
6. Place a 1.5" to 2" (3.8 cm to 5 cm) piece of heat shrink on each mini coaxial cable, but do not heat it yet.
7. Install and crimp a male BNC connector onto each of five mini coaxial cables. The white mini coaxial cable is not used by the buffer; it can be insulated and set aside or trimmed back 7" to 8".
8. Slide the heat shrink over the ferrule of each attached BNC connector, and heat it to fasten the heat shrink in place.
9. Place a 6" (15 cm) piece of heat shrink on each set of shielded twisted pair wires (one on white/black, one on red/black, one on orange/black), but do not apply heat yet.
10. Separate the wire braid from the white/black and red/black shielded twisted pair conductors for about 1" (2.5 cm) from the ends. For each twisted pair set, twist the strands of the wire braid together.
11. Strip 1/4" (13 mm) of insulation from the ends of the white/black and red/black twisted pair wires. Twist each conductor's stranded wires.
12. The left half of the 10-pole connector is for audio output to the RGB 320. See the diagrams on pages 2-14 and 2-15, which show wiring for balanced audio output. See the illustration below for a comparison of wiring for unbalanced (high impedance) or balanced (high impedance or 600 ohms) stereo audio output.



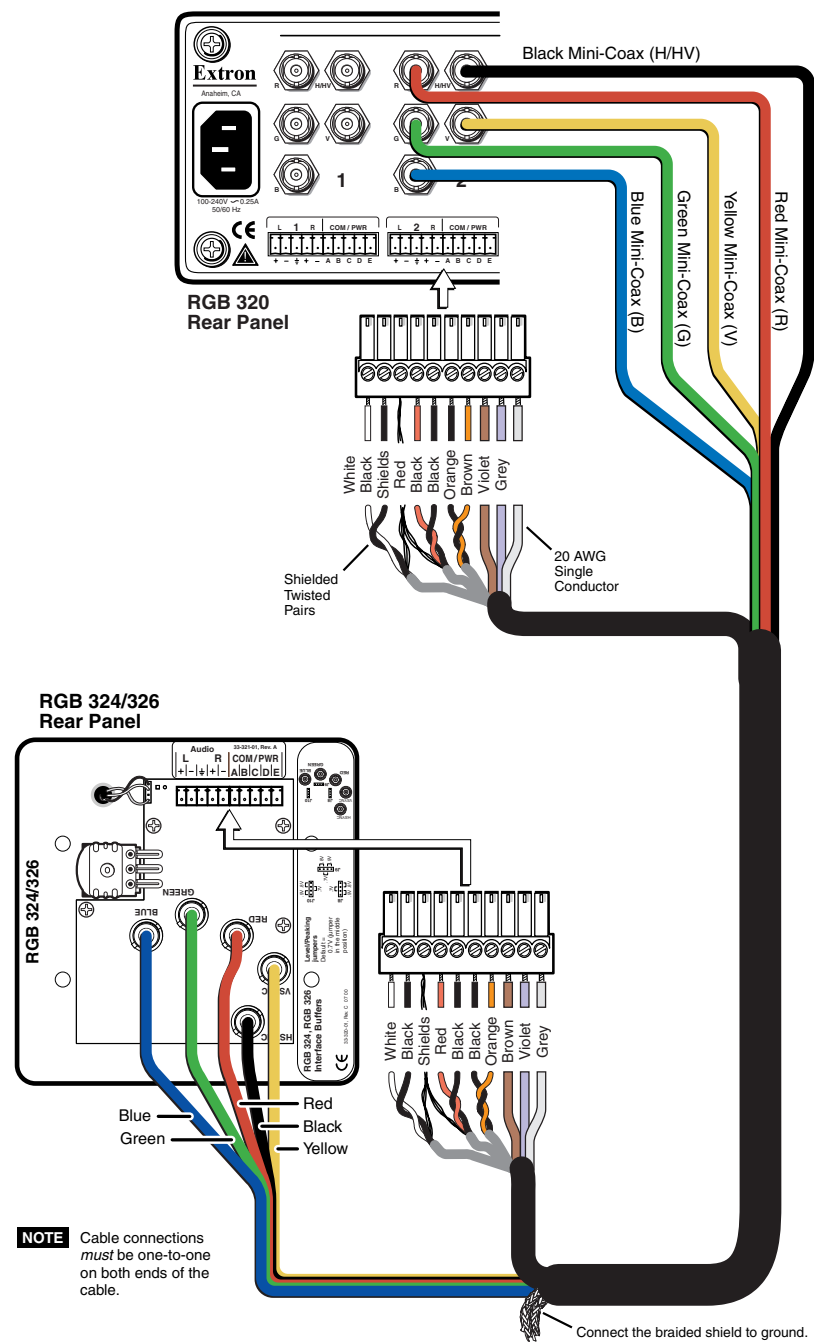
### WARNING

Connect the sleeve to ground. Connecting the sleeve to a negative (-) terminal will damage the audio output circuits.

- Insert the tips of the white/black twisted pair wires into the captive screw connector for left audio. Insert the tips of the red/black twisted pair wires into the captive screw connector for right audio. For balanced audio output, white = L+, black = L-; red = R+, black = R-.
13. Twist together the wire braids from both (white/black and red/black) twisted pairs.
14. Insert the twisted braid into the ground connection on the audio part of the captive screw connector. See the illustrations in step 12 and the wiring diagram on page 2-14.
15. Separate about 1" (2.5 cm) of the wire braid from the ends of the orange/black shielded twisted pair conductors, and cut the braid off.
16. Strip 1/4" (13 mm) of insulation from the ends of the orange/black twisted pair wires. Twist each conductor's stranded wires.
17. Insert the black wire into the slot for pin A and the orange wire into the slot for pin B of the captive screw connector.
18. Slide the heat shrink on the white/black, red/black, and orange/black twisted pairs toward the connector so no wire braid is exposed near the connector. Apply heat to fasten the heat shrink onto the wires to insulate the braided shields.
19. Strip 1/4" (13 mm) of insulation from the ends of the brown, violet, and grey single conductor (20 AWG) wires.
20. Insert the tip of the brown wire into the slot for pin C on the captive screw connector, insert the violet wire into D, and the grey wire into E. See page 2-14.
21. Repeat steps 3 through 20 to attach a 10-pole captive screw connector, BNCs, and heat shrink to the other end of the cable. Make sure that connections are the same on both ends.
22. Plug the captive screw connector on one end of the cable into the buffer's receptacle, and connect the adjacent BNCs to the output BNCs on the buffer's rear panel.
23. Attach the BNCs and captive screw connector on the other end of the cable to the appropriate input connectors on the RGB 320's rear panel.
24. Apply power to the RGB 320.



Cable wiring diagram: connecting an RGB 340 to the RGB 320



Cable wiring diagram: connecting an RGB 324/326 to the RGB 320



### Pre-installation testing/troubleshooting

Before installing a buffer into the wall or furniture, test the system to make sure that the connections and settings are correct.

1. With the power disconnected from the RGB 320, connect the cables between the buffer and the RGB 320 as described in “Preparing and terminating the cable” in this chapter.
2. Apply power to the RGB 320. The power LED on the buffer will light steadily to indicate that the buffer is receiving power.
  - If the power LED does not light, check the captive screw connector wiring at both the buffer and the RGB 320. If the conductor assignments are not the same at both ends, the buffer will not turn on, and circuits may be damaged if power is applied to the wrong pole.

### If the image does not appear or there is no sound

1. Make sure that the RGB 320 and the buffer are powered on (see above), and that the source computer connected to the buffer is powered on.
2. Verify that the connectors are wired identically at both ends of the cable connecting the buffer to the RGB 320. Ensure that the audio portion is wired correctly for the input signal (balanced or unbalanced).
3. Verify that the front panel High Z/75 ohm video input termination switch has been set correctly.
  - The switch should be set to High Z if a local monitor is connected, a laptop breakout cable is used, or the picture is too dark (double-terminated).
4. Select that buffer as the active input to the RGB 320.
  - The RGB 326 buffer must be selected via the RGB 320 front panel or an RS-232 control device. The Active LED on the front panel of the RGB 326 will light when that buffer is selected as the active input.
  - The RGB 324 and RGB 340 can be selected via the RGB 320 front panel or an RS-232 control device, or by pressing the Show Me/Select button on the buffer. If the Show Me/Select button blinks, the RGB 320 is busy, and the Show Me/Select button must be pressed a second time.
5. Call the Extron S3 hotline if the image still does not appear or there is no sound.

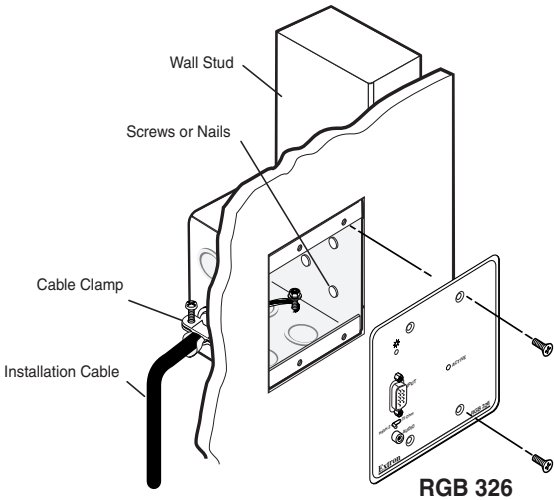
### If the image is not displayed correctly

1. If the picture looks too green, the computer may be sending video with sync on green (SOG), and the display device may not be configured to handle SOG signals. The buffers do not strip sync from the video input signals.
2. If the picture “hangs off” the edges of the screen, adjust the horizontal centering and/or vertical centering (RGB 324 and RGB 340 only). See page 2-6 for details.
3. If the picture is too bright or too dark, try changing the front panel High Z/75 ohm termination switch (all buffer models, see page 2-5), adjust the level/peaking jumpers (all models, see page 2-9), or adjust the video level (RGB 324/RGB 340 only, see page 2-6).
4. If the edges of the image seem to exceed their boundaries, or if thin lines and sharp edges look thick and fuzzy, change the level/peaking jumper settings. See page 2-9.
5. If the picture appears and is stable, but it has ghosting or blooming, try changing the High Z/75 ohm video input termination (see page 2-5). If the problem is not resolved by changing the termination, try using a different input cable.
6. If the picture still is not displayed correctly, call the Extron customer support hotline.

### Mounting the buffer to the wall box (RGB 324, RGB 326)

Once the system has been cabled and tested, the buffer can be installed in the wall or furniture.

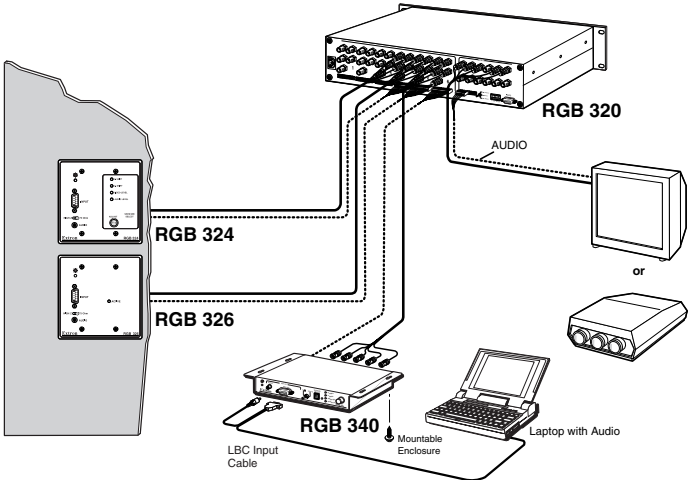
1. Remove power from the RGB 320 by disconnecting the power cord.
2. Detach the input cables from the buffer’s front panel.
3. Place the buffer through the opening in the wall or furniture and into the wall box (if one is used).
4. Mount the buffer’s faceplate to the wall box with the provided machine screws as shown in the illustration on the next page, or attach the buffer directly to the furniture with wood or metal screws.



**Mounting the buffer to the wall box**

- 5. Reconnect the input cables to the buffer's front panel connectors.
- 6. Reconnect the power cables and restore power to the equipment.

**Application diagram**



**A typical system featuring the RGB 320 and several buffers**



**RGB 324/326/340**

# Appendix

## Specifications, Accessories, and Part Numbers

- Specifications
- Included Parts
- Accessories
- Cables



Specifications

Video

Gain .....	Unity (0.7V p-p), (0.8V p-p) 15% with 3dB peaking, (0.9V p-p) 30% with 6dB peaking
Bandwidth .....	300 MHz (-3dB)

Video input

Number/signal type .....	1 analog RGBHV, RGBS, RGsB, RsGsBs
Connectors .....	1 9-pin D male analog for MBC/LBC cable
Nominal level(s) .....	Analog ..... 0.3V to 1.45V p-p
Impedance .....	75 ohms or Hi Z, switchable (set to 75 ohms if no local monitor is connected)
Horizontal frequency .....	15 kHz to 100 kHz (optimum 15 kHz to 62 kHz)
Vertical frequency .....	30 Hz to *170 Hz

Video output

Number/signal type .....	1 analog RGBHV, RGBS, RGsB, RsGsBs
Connectors .....	5 BNC female
Nominal level .....	Analog ..... 0.7V p-p, 0.8V p-p, 0.9V p-p (internal jumper-selectable) with peaking
Impedance .....	75 ohms
Return loss .....	-48dB @ 5 MHz

Sync

Input type .....	RGBHV, RGBS, RGsB, RsGsBs
Output type .....	RGBHV, RGBS, RGsB, RsGsBs; TTL buffered to RGB 320 control unit
Input level .....	3.0V to 5.0V p-p (referenced to ground)
Output level.....	4.0V to 5.0V p-p
Input impedance .....	10 kohms
Output impedance.....	75 ohms
Max propagation delay.....	45 nS
Max. rise/fall time .....	3.9 nS
Polarity .....	Positive, negative

Audio — buffered to RGB 320

Gain .....	Unbalanced 0dB, balanced +6dB
Frequency response .....	20 Hz to 20 kHz, ±0.05dB
THD + Noise .....	0.03% @ 1 kHz, 0.3% @ 20 kHz at rated maximum output drive

S/N .....	>90dB, output 17dBu, balanced
Stereo channel separation.....	>95dB @ 1 kHz to 20 kHz

Audio input — buffered to RGB 320

Number/signal type .....	1 stereo, unbalanced; 1.0Vrms (+4dBu), 20 Hz to 20 kHz
Connectors .....	3.5 mm stereo jack (2 channel), unbalanced; tip (L), ring (R), sleeve (ground)
Impedance .....	10 kohms, DC coupled
Maximum level .....	+8.5dBu

Audio output — buffered to RGB 320

Number/signal type .....	1 buffered, stereo (2 channel), balanced / unbalanced
Connectors .....	1 3.5 mm captive screw terminal, 10 pole
Impedance .....	50 ohms unbalanced, 100 ohms balanced
Gain error .....	±0.1dB channel to channel
Drive (into RGB 320 audio input) ..	> +16dBu, balanced at stated %THD+N

NOTE 0dBu = 0.775 volts (RMS).

General

Power .....	±8VDC, supplied via RGB 320
Temperature/humidity .....	Storage -40° to +158°F (-40° to +70°C) / 10% to 90%, non-condensing Operating +32° to +122°F (0° to +50°C) / 10% to 90%, non-condensing
Rack mount.....	No, but wall- or furniture-mountable
Enclosure type.....	Metal
Enclosure dimensions	
RGB 324/326	
Plate .....	4.5" H x 4.5" W (11.43 cm H x 11.43 cm W)
Circuit board on plate ..	2.8" H x 3.5" W x 1.3" D 7.1 cm H x 8.9 cm W x 3.3 cm D
Box .....	3.75" H x 3.65" W x 3.5" D (2-gang) 9.5 cm H x 9.27 cm W x 8.9 cm D (2-gang)
RGB 340 .....	1.25" H x 5.7" W x 4.5" D (width including flanges = 6.95") 3.18 cm H x 14.5 cm W x 11.4 cm D (width including flanges = 17.65 cm)
Shipping weight.....	RGB 324/326 ..... 3 lbs (1.4 kg) RGB 340 ..... 2 lbs (0.9 kg)

Specifications, Accessories & Part Numbers, cont'd

Vibration .....	NSTA 1A in carton (National Safe Transit Association)
Approvals .....	UL, CE, FCC Class A
MTBF .....	30,000 hours
Warranty .....	2 years parts and labor

**NOTE** Specifications are subject to change without notice.

Included Parts

These items are included in each order for a buffer:

Included parts	Part number
RGB 324	60-234-01 (grey) or 60-234-02 (black) or 60-234-03 (white)
or RGB 326	60-235-01 (grey) or 60-235-02 (black) or 60-235-03 (white)
or RGB 340	60-279-01 (grey)
3.5mm, 10-pole captive screw connector	10-319-11

Accessories

Accessories	Part number
RGB 320 switching interface	60-232-01
3.5 mm stereo plug	10-306-01

Cables

Bulk installation cable	Part number
Plenum seventeen conductor installation cable	
500 feet (152 meters)	22-111-03
1000 feet (308 meters)	22-111-04



**RGB 324/326/340**

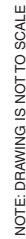
Appendix B

Dimensions and Template

Dimensions  
Template

## Dimensions

## RGB 326 dimensions



① PEM STANDOFF BSOS-440-22

**DETAIL A**  
SCALE: 2/1

**DETAIL B**  
SCALE: 2/1

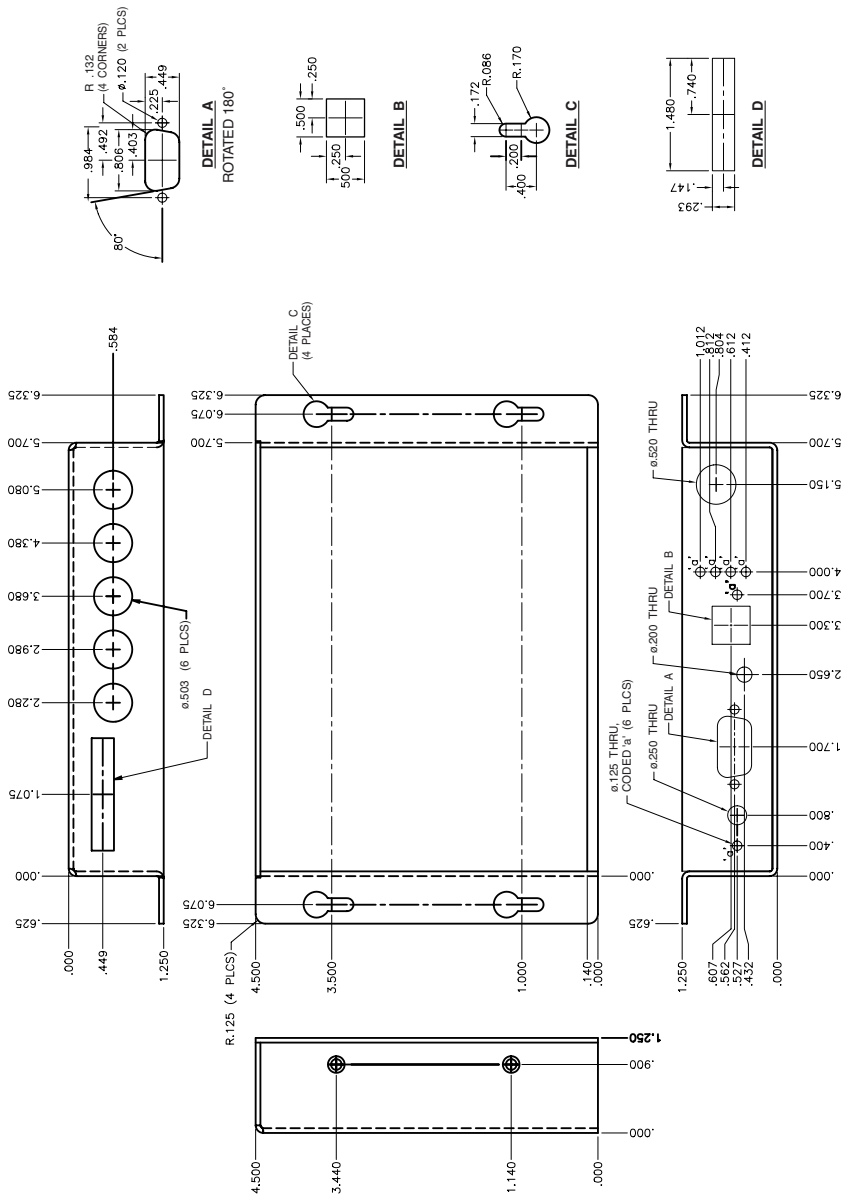
**DETAIL C**  
SCALE: 2/1

**DETAIL D**  
SCALE: 2/1



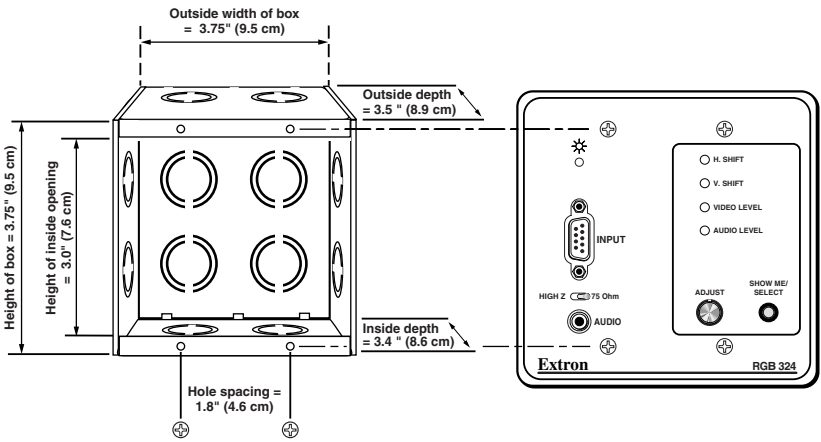
NOTE: DRAWING NOT TO SCALE

RGB 340 dimensions



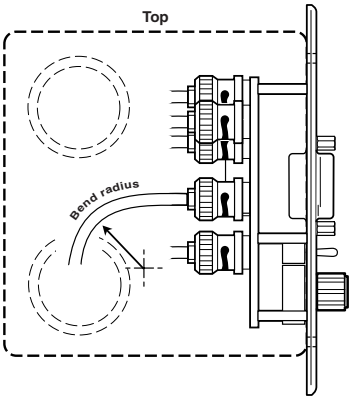
RGB 324/RGB 326 wall box dimensions

Below is a diagram of the dimensions of the electrical wall box that is shipped with an RGB 324 or RGB 326. If you use a different wall box, use its measurements when planning the installation.



Whether you use the electrical wall box supplied with the buffer, another wall box, or no box, allow enough depth in the installation space to accommodate the bend radius of the cable. The bend radius is usually at least ten times the diameter of the outer cable jacket, but it varies with the type of cable.

**NOTE** The cable should be bent in a smooth arc and never kinked. If the cable is bent too sharply or kinked, the cable characteristics will change, and performance may decrease.



RGB 324/RGB 326 Cut-out Template

Use the full-size template below as a guide to mark and cut the hole in the wall or furniture through which the buffer will be installed. The template includes the recommended 0.1" (0.25 cm) clearance on all sides of the electrical wall box to allow room for the raised areas surrounding the knockouts. See chapter 2 for details on installing the buffers.

